

WHAT IS CLAIMED IS:

1. An electrode for an electrochemical cell in which an active material in an electrode material is a proton-conducting compound, wherein the electrode material
5 comprises a nitrogen-containing heterocyclic compound or a polymer having a unit containing a nitrogen-containing heterocyclic moiety.

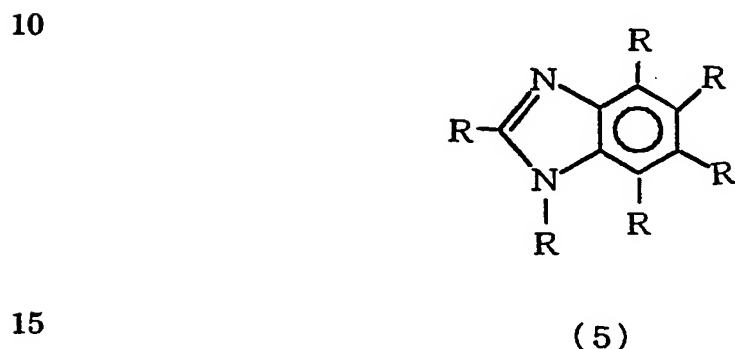
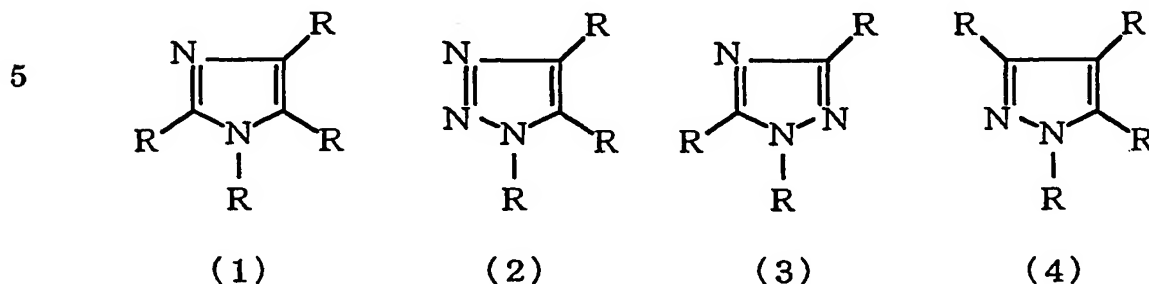
2. The cell electrode as claimed in Claim 1 wherein
10 the electrode material comprises a nitrogen-containing heterocyclic compound and a polymer having a unit containing a nitrogen-containing heterocyclic moiety.

3. The cell electrode as claimed in Claim 1, used
15 for an electrochemical cell wherein only protons act as a charge carrier in a redox reaction in both electrodes associated with charge and discharge.

4. The cell electrode as claimed in Claim 1,
20 wherein the nitrogen-containing heterocyclic compound is one or more selected from the group consisting of imidazole, triazole, pyrazole, benzimidazole and their derivatives.

5. The cell electrode as claimed in Claim 4,
25 wherein the nitrogen-containing heterocyclic compound is one or more selected from the group consisting of imidazole or its derivative represented by formula (1), triazole or

its derivative represented by formula (2) or (3), pyrazole or its derivative represented by formula (4) and benzimidazole or its derivative represented by formula (5):



wherein R independently represent hydrogen, alkyl having 1 to 4 carbon atoms, amino, carboxyl, nitro, phenyl, vinyl, halogen, acyl, cyano, trifluoromethyl, alkylsulfonyl or trifluoromethylthio.

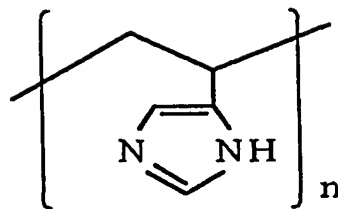
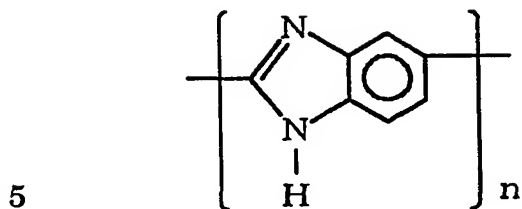
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6. The cell electrode as claimed in Claim 1 comprising a polymer containing a benzimidazole moiety, benzbisimidazole moiety or imidazole moiety as the polymer.

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7. The cell electrode as claimed in Claim 1 comprising polybenzimidazole represented by formula (6) or polyvinylimidazole represented by formula (7) as the

polymer:



wherein n represents a positive integer.

10 8. The cell electrode as claimed in Claim 1 comprising 1 to 80 parts by weight of the nitrogen-containing heterocyclic compound to 100 parts by weight of the active material.

15 9. The cell electrode as claimed in Claim 1 comprising 1 to 80 parts by weight of the polymer to 100 parts by weight of the active material.

20 10. The cell electrode as claimed in Claim 2 comprising 1 to 80 parts by weight of the nitrogen-containing heterocyclic compound and the polymer to 100 parts by weight of the active material.

25 11. An electrochemical cell wherein at least one of the electrodes is the electrode as claimed in Claim 1 and both electrodes comprise a proton-conducting compound as an active material.

12. An electrochemical cell as claimed in Claim 11
comprising an electrolyte containing a proton source
wherein only protons act as a charge carrier in a redox
5 reaction in both electrodes associated with charge and
discharge.

13. A secondary battery comprising the
electrochemical cell as claimed in Claim 11.
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14. A capacitor comprising the electrochemical cell
as claimed in Claim 11.